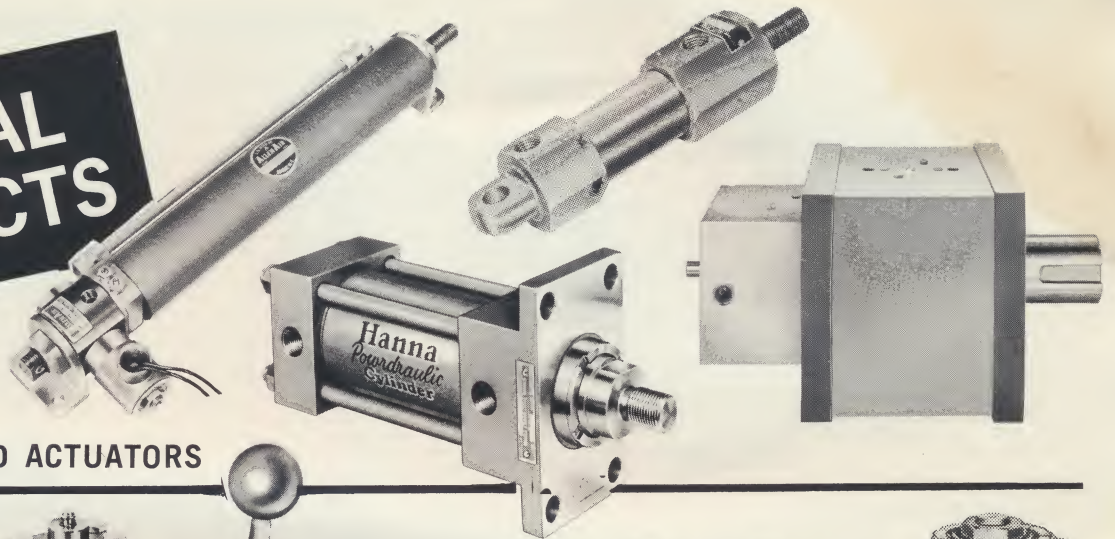
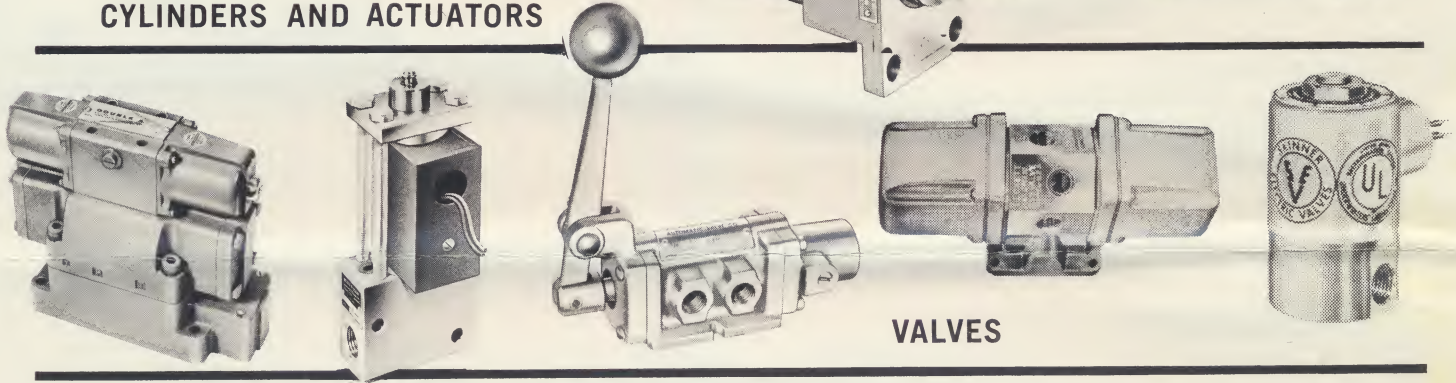


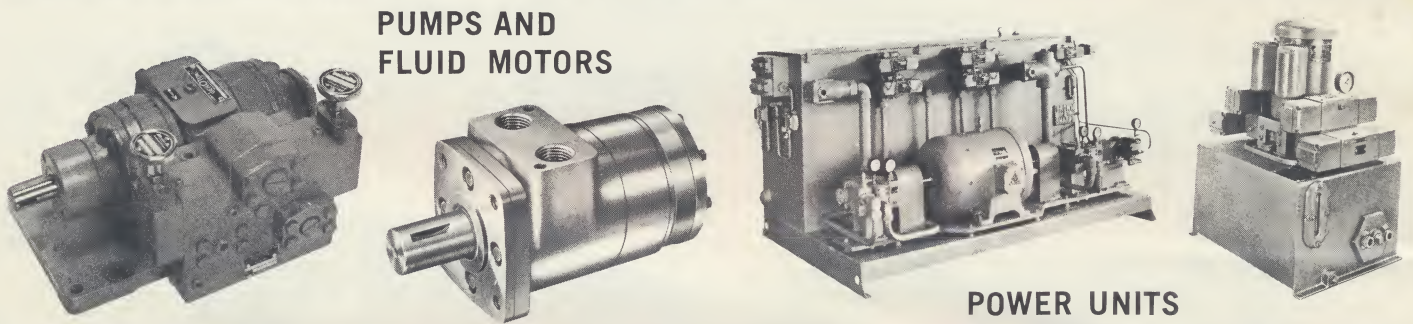
AIROYAL PRODUCTS



CYLINDERS AND ACTUATORS

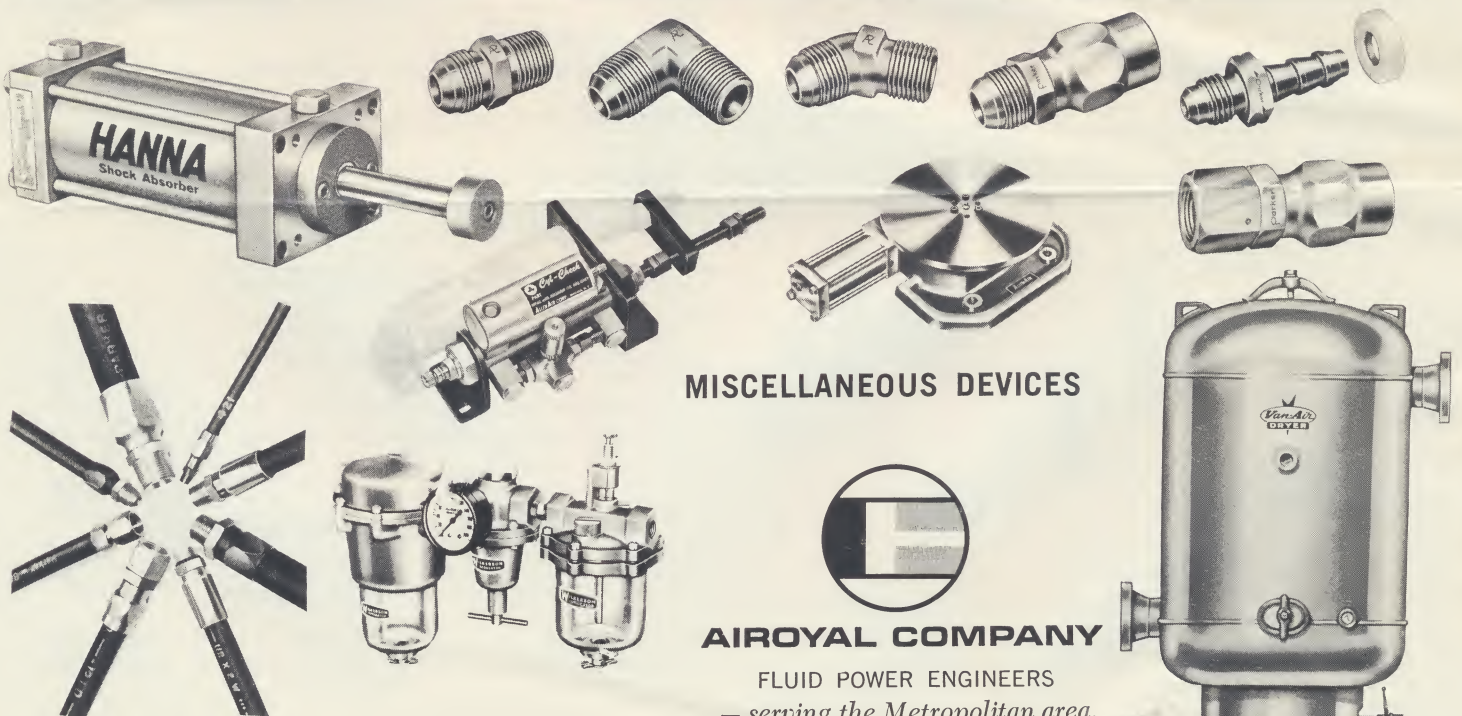


VALVES



**PUMPS AND
FLUID MOTORS**

POWER UNITS



MISCELLANEOUS DEVICES



AIROYAL COMPANY

FLUID POWER ENGINEERS
— serving the Metropolitan area.

AIROYAL SERVICES

AFFILIATED COMPANIES

THE ENGINEERING/SERVICE DIVISION OF AIROYAL COMPANY handles all matters relating to field service, such as trouble shooting, installation, repairs, contract maintenance, piping and start-up. AIROYAL MANUFACTURING COMPANY distributes nationally the AIROYAL line of small bore cylinders and related accessories and devices. AIROYAL ENGINEERING COMPANY manufactures hydraulic material handling equipment, power units and test stands. FLUID POWER CONSULTANTS is a consulting engineering firm specializing in the solution of industrial problems through the application of hydraulic, pneumatic and electrical equipment.



FABRICATION

Special machines, power units or hydraulic-pneumatic components can be fabricated in AIROYAL'S shops. AIROYAL will guarantee quality of manufacture and insure delivery as promised.



SERVICE AND INSTALLATION

AIROYAL offers maintenance and trouble-shooting of hydraulic and pneumatic systems. In addition, AIROYAL will install hydraulic and pneumatic power or control systems on your own machines in your own plant.

APPLICATION ENGINEERING ASSISTANCE

AIROYAL'S staff of skilled sales personnel — the largest in the Greater New York area — are readily available to provide proper selection of the best components for the practical solution of your control and power problems. This group is backed up by AIROYAL'S experienced and highly skilled Staff Engineering Department. Our President, Addison T. Smith, is a Licensed Professional Engineer.



FAST DELIVERY

AIROYAL maintains a large inventory of most of the standard fluid power items. These include air and hydraulic cylinders and valves, pumps, fluid motors, accumulators, tube and pipe fittings, air dryers, air and hydraulic hose and hose assemblies, and air filters, regulators and lubricators. In addition, AIROYAL maintains an inventory of spare and repair parts for the products it sells. Any items shipped from AIROYAL stock will be delivered the next day by United Parcel Service. For items not in stock, AIROYAL maintains direct contact with its principals by telephone, FAX and TWX.

REPAIR OF COMPONENTS

Where field repair is practical, AIROYAL is equipped to repair and recondition hydraulic and pneumatic components. It will repair equipment of all manufacturers including those not directly represented by AIROYAL.



AIROYALEASE OF COMPONENTS AND SYSTEMS

Components or complete Fluid Power systems may be leased from AIROYAL. Benefits include conservation of working capital, elimination of the need to borrow the purchase price, and reduction in the required investment in capital equipment.

ONE SOURCE RESPONSIBILITY

A single order placed with AIROYAL for all your components or system requirements eliminates costly and time-consuming contacts with various individual manufacturers. We thereby assume full responsibility for expediting, delivery, single billing, performance, and shop and field service.

AIROYAL COMPANY

FLUID POWER ENGINEERS
— serving the Metropolitan area.



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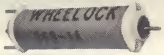
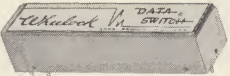
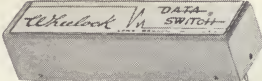
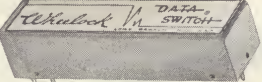
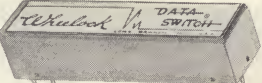
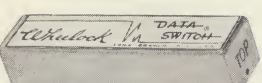
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(You get the switch most suitable for your application.)

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in a shock-absorbing, nylon frame. No epoxy encapsulation: no curing stresses.

WHEELOCK Reed Relays can withstand vibration of 30 G at 2000 cps
and shock of 50 G's without opening.

REED RELAY TYPES	CONTACT ARRANGEMENT	CONTACT RATING	LIFE	COIL VOLTAGE	TYPICAL INITIAL CONTACT RESISTANCE	OPERATE TIME	RELEASE TIME
 Series 330, Size, .23 dia. x .95	1A	4 Watts DC resistive 0.125 amp max. 200 V DC max.	3 x 10 ⁶ operations @ max. rating 20 x 10 ⁶ operations @ ½ max. rating	1, 3, 6, 12, 18 24 V DC	0.100 ohms	0.7 ms avg. 1.0 ms max. (0.1 ms avg. contact bounce)	40μs avg.
 Series 262, 1A Size, .43 x .43 x 1.44	1A 1B 1C 2A 2B 3A 4A 6A	4 Watts DC resistive 0.125 amp max. 200 V DC max.	3 x 10 ⁶ operations @ max. rating 20 x 10 ⁶ operations @ ½ max. rating	6, 12, 24, 48 V DC	0.100 ohms	0.7 ms avg. 1.0 ms max. (0.1 ms avg. contact bounce)	40μs avg.
 Series 3002 Std., 1A Size .68 x .62 Hi x 2.69	1A 1B 2A 2B 3A 4A 5A	15 Watts DC resistive 1.0 amp max. 250 V DC max.	20 x 10 ⁶ operations @ max. rating 100 x 10 ⁶ operations @ ½ max. rating	6, 12, 24, 48, 120 V DC	0.050 ohms	2.0 ms avg. 2.8 ms max. (0.2 ms avg. contact bounce)	100μs avg.
 Series 3002 Hi Watt, 1A Size .68 x .62 Hi x 2.69	1A 1B 2A 2B 3A 4A 5A	50 Watts DC resistive 3.0 amp max. 250 V DC max.	20 x 10 ⁶ operations @ max. rating 100 x 10 ⁶ operations @ ½ max. rating	6, 12, 24, 48, 120 V DC	0.080 ohms	2.0 ms avg. 2.8 ms max. (0.2 ms avg. contact bounce)	100μs avg.
 Series 3002 Std. C, 1C Size .68 x .62 Hi x 2.69	1C 2C 3C 4C 5C	10 Watts DC resistive 0.5 amp max. 250 V DC max.	20 x 10 ⁶ operations @ max. rating 100 x 10 ⁶ operations @ ½ max. rating	6, 12, 24, 48, 120 V DC	0.040 ohms	2.0 ms avg. 2.8 ms max. (0.2 ms avg. contact bounce)	500μs avg.
 Mercury-Wetted Series 3002 Hg, 1A Size .68 x .62 Hi x 2.69	1A 2A 3A 4A 5A	50 Watts DC resistive 3.0 amp max. 400 V DC max.	over 100 x 10 ⁶ @ max. rating	6, 12, 24, 48, 120 V DC	0.025 ohms	2.0 ms avg. 2.8 ms max.	100μs avg.

Complete information

available from your

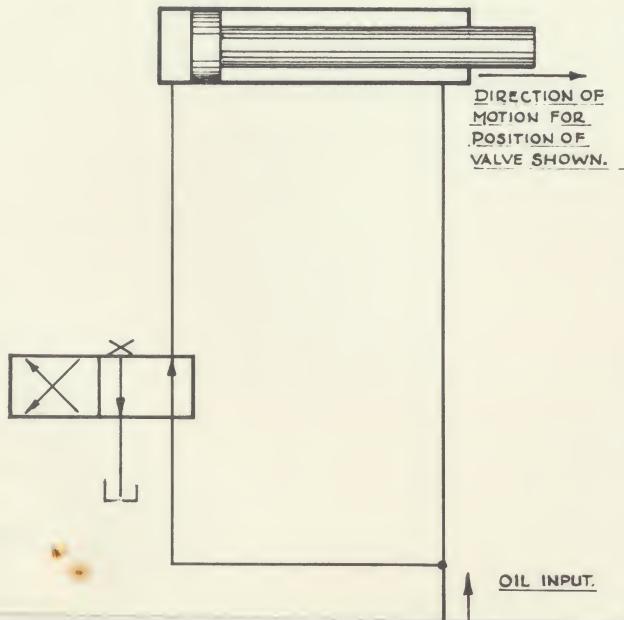
Wheelock Sales Representative

or write to ...

AUTHORIZED REPRESENTATIVE
HATCH - HUTCHINSON ASSOCIATES
19 KEARNEY ROAD
NEEDHAM HEIGHTS 94, MASS.
Telephone HIllcrest 4-1259

Wheelock

273 Branchport Ave.
Long Branch, N. J. — 07740



SUBJECT: Regenerative Circuit, Two-Position Valve, Hydraulic

PROBLEM: To obtain rapid advance of a cylinder and/or to obtain equal force and speed of a cylinder in both directions of travel.

SOLUTION: This circuit shows the use of a cylinder with 2:1 rod (Bore area equal to 2 times rod area). With the control valve in the position shown, oil discharged from the rod end of the cylinder joins with the pump output, so that the effective volume of oil being directed to the blind end of the cylinder is twice the pump rating. Reversing the control valve directs oil to the rod end of the cylinder, which returns at a rate exactly equal to that at which it had advanced. (INTERESTING EXERCISE: Prove that the oil volume entering the cylinder during its forward stroke is exactly twice the pump output.)

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We've just added a new man to our sales force, and we want all our

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Aaron Kutz has been in the fluid power business for ten years, as a sales engineer for a component manufacturer and as chief engineer for a manufacturer of special air and oil powered automatic machinery. Those of you (on Long Island) who do not already know Aaron will find him most knowledgeable and creative.

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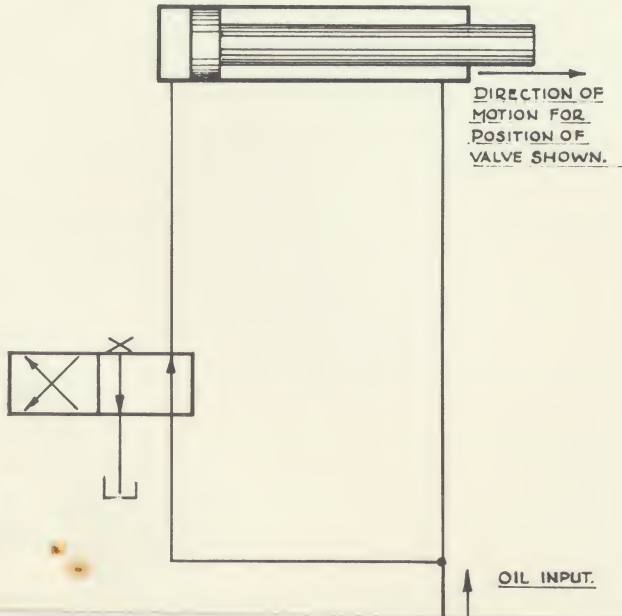


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**CIRCUIT
CARD 14**



SUBJECT: Regenerative Circuit, Two-Position Valve, Hydraulic

PROBLEM: To obtain rapid advance of a cylinder and/or to obtain equal force and speed of a cylinder in both directions of travel.

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